

# Hematologic and biochemical changes in caprine whole blood stored in CPDA-1 for 28 days

H. Neill,<sup>1</sup>DVM; C. Scully,<sup>2</sup>DVM, MS, DACT; C. Lui,<sup>2</sup>MS, PhD, MAppStat; R. Baker,<sup>2</sup>BVMS, MS, DACVIM (LAIM)

<sup>1</sup>Kansas State University, Manhattan, KS 66506

<sup>2</sup>Louisiana State University, Baton Rouge, LA 70803

## Introduction

Parasitic anemia is a common affliction of goats in the United States that, in severe cases, requires a blood transfusion. There is currently limited data published on blood storage in small ruminants, goats in particular. With an increase in pet goats as well as a population of show and breeding animal owners, there is an increasing demand for blood transfusions in these patients to treat their anemia. The primary objective of this study was to determine biochemical and hematologic changes in caprine whole blood stored in citrate phosphate dextrose adenine solution (CPDA-1) over 28 days, particularly those that would impact transfusion efficacy, including packed cell volume (PCV) and percent hemolysis in excess of 1%.

## Materials and methods

Ten healthy Boer blood donor goats were selected and 250 ml whole blood was drawn into a commercially available CPDA-1 blood collection bag and stored at 37 °F. Blood samples were taken at collection and every 7 days from the bags for a total of 28 days samples to determine biochemical and hematologic values of stored blood. Values were obtained by performing an EPOC (Element Point-of-Care, Heska) to obtain pH, lactate, glucose, and electrolyte values, a manual PCV and total protein, a hemogram, and plasma hemoglobin concentrations to determine percent hemolysis. At the end of 28 days blood was submitted for aerobic and anaerobic culture. A mixed-effects repeated-measures ANOVA was used to assess the fixed effect of time with animal as a random effect.

## Results

Percent hemolysis means remained the acceptable (< 1%) in all samples through Day 21. At Day 28, 8 of the 10 samples had exceeded 1%. The mean PCV did not change significantly over 28 days ( $P = 0.0966$ ) and over that time ranged from 24.6-29.4%, remaining within normal range (normal: 22-38%) at all time points. Lactate and pH also changed significantly over the 28 days ( $P < 0.0001$ ). Mean lactate ranged from 1.17-3.75 mmol/L and mean pH from 7.17-7.04 over the course of the 28 days. Culture results from all samples were negative.

## Significance

Biochemical and hematologic values for caprine blood stored in CPDA-1 indicate it could be suitable for transfusion after 2-3 weeks of storage with statistically and potentially clinically significant changes found after 3 weeks. In vivo studies are needed to determine safety and efficacy of using stored caprine whole blood for transfusions.

